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Test Instructions

- mechanical -

Xperia Z1™
C6902, C6903, C6906, L39h

1277-9815 Rev 3
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For general information about test procedures, refer to 1220-1333: Generic Repair Manual – mechanical

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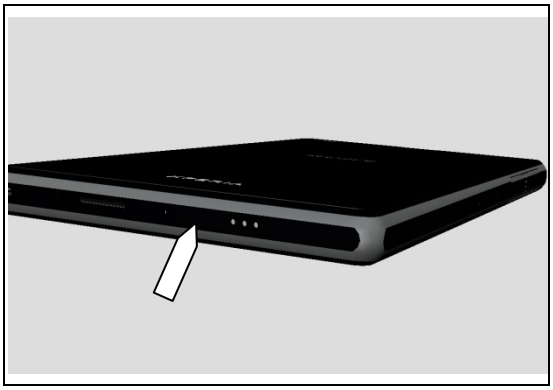
1 Pre-Test Preparation

1.1 Process flow – Water Resistance Test (WRT) for incoming units

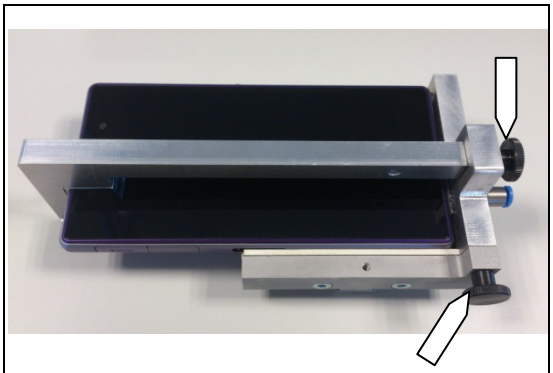
Follow the process according the 1269-3536 Water Resistant Test for PC - mechanical in the including document Test Instruction WRT

Remove the Speaker Panel following Working Instruction-1277-9813.

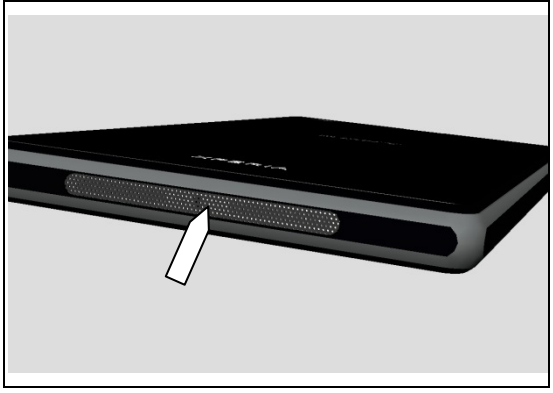


Install the “WRT Inlay plate” into the generic “WRT Generic Side Inlay”

Connect it according to 1269-3536 Water Resistant Test for PC - mechanical in the including document Test Instruction WRT.



Attach Speaker Panel following Working Instruction 1277-9813.



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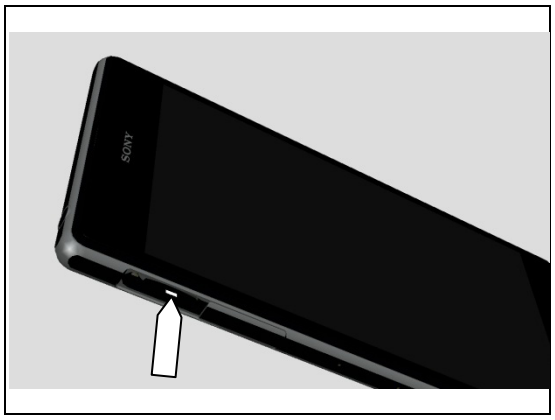
Pre-Test Preparations

1.2 Hardware



1.2.1 Water indicator inspection

Before starting any tests the Liquid Indicator has to be checked.

The indicator is located as shown in this picture after the SD Cap is opened.

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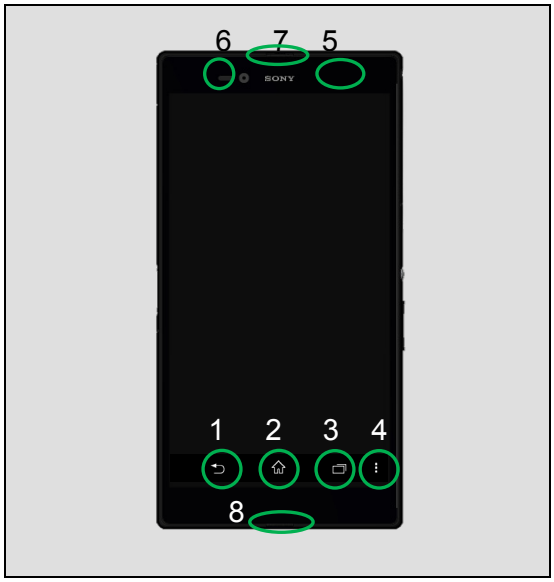
Pre-Test Preparations

1.3 Test Enablers

These are items on the phone that are used during the test of the unit.

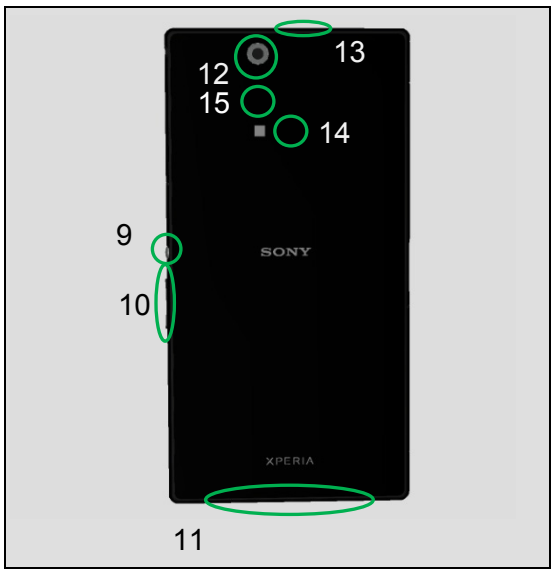
Front:

1. Back Key
2. Home Key
3. Multi Key
4. Menu key
5. Secondary Camera
6. Ambient Sensor, Proximity Switch
7. Earphone and Notification LED
8. Microphone



Back:

9. On/Off Key
10. Volume up/down Key
11. Speaker
12. Camera
13. Secondary Microphone
14. NFC
15. LED Flash



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Pre-Test Preparations

1.4 Software

1.4.1 Software update

1.4.1.1 Software version verification

Check the software version of the phone for fault verification. The latest improvements are found on the support pages under the support news
http://www.sonyericsson.com/cws/marketingurlportal?pageid=key.SupportZone.Overview

- Start up the phone
  - Note: Make sure the phone is in call setup.
- Press the following keypad combination: *#*#7378423#*#*
- Select 'Service info'
- Select 'Software info'
- Check the software file revisions and, if needed, update as described below:

For more information, refer to 1220-1333: Generic Repair Manual - mechanical

1.4.1.2 Software version update

Mandatory first repair action!
Use the USB cable to connect with the Micro USB connector of the phone for this purpose!

Ensure the phone is powered off and proceed as follows:

- Open the Emma application and log in.
- Press and hold the volume down key on the phone, connect the phone to the USB cable and then release the volume down key.
- Select the appropriate service and follow the on-screen instructions.

Note: For phones with eMMC flash memory (built in "SD card" memory), the only service which erase this eMMC memory is Service's "Refurbish" and "Customize". See also emma User Guide info. http://emma.extranet.sonyericsson.com/documents/emma_user_guide.pdf (see "Service Types" and "Aspects of large files")

In Swap flow, when change a phone from Customer A to Customer B, always use the service Customization script.

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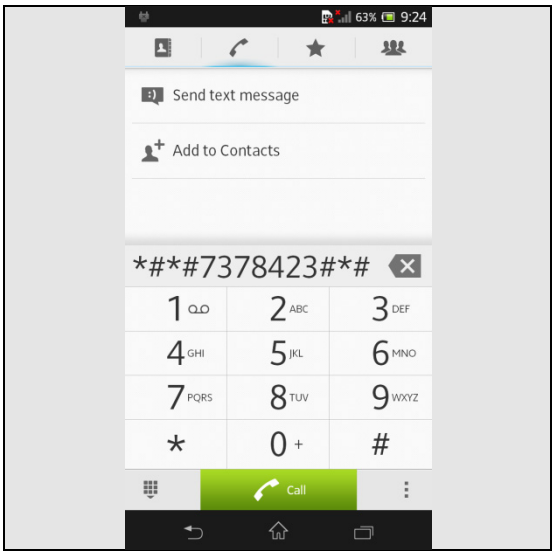
2 Tests

2.1 Service Test Mode

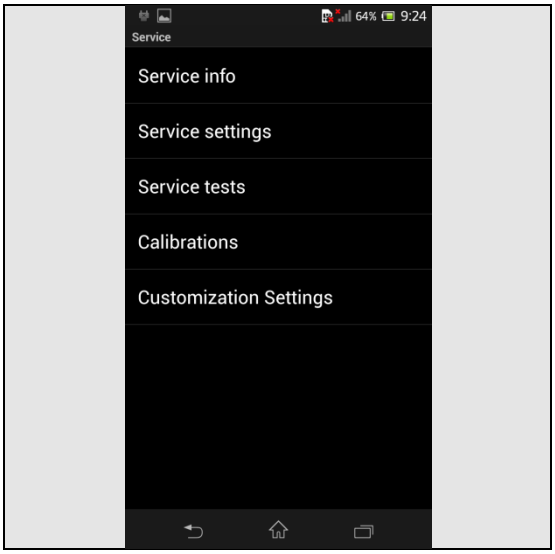


Note: Make sure the phone is in call setup when pressing these touching keypads to get into the Service menu!

Stamina mode needs to be turned off before entering Service Test Mode
Settings -> Power management -> STAMINA

Start up the phone and enter the service menus:

- Press the following keypad combination: *#*#7378423#*#*



- Select ‘Service tests’
- Select one of the tests and follow the test instructions as described below
- To stop the test and return to the ‘Service tests’ menu, press the Back key

For more information, refer to
1220-1333: Generic Repair Manual - mechanical

The following pictures will show a simplified basic phone for a general visualization of the service tests!

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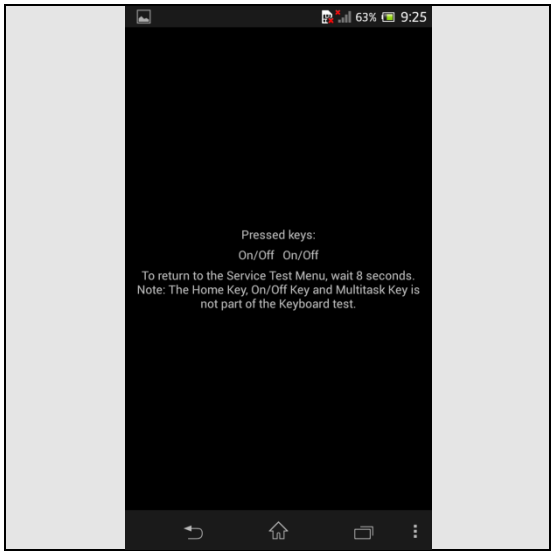
2.2 Service Tests

2.2.1 Keyboard & Switch

Text Note: The Home Key, On/Off key and Multitask Key are not part of the keyboard test, but are in the Manual tests.
To return to the Service Test Menu, wait for 8 seconds.

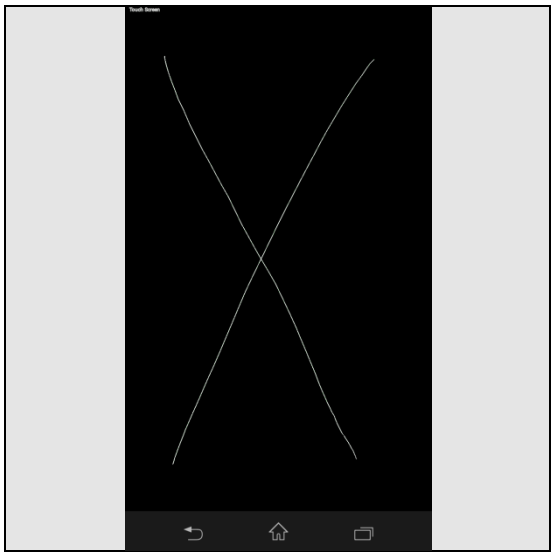
Press all keys on the:
-Back key
-Menu key
-Volume up key
-Volume down key
-Auto Focus/Camera key



2.2.1 Touch Screen

Move a finger across the touch screen, a line will be drawn as it touches.
Check all area of the touch screen as indicated by the two lines.

Press the Back key to return to the Service Test Menu.

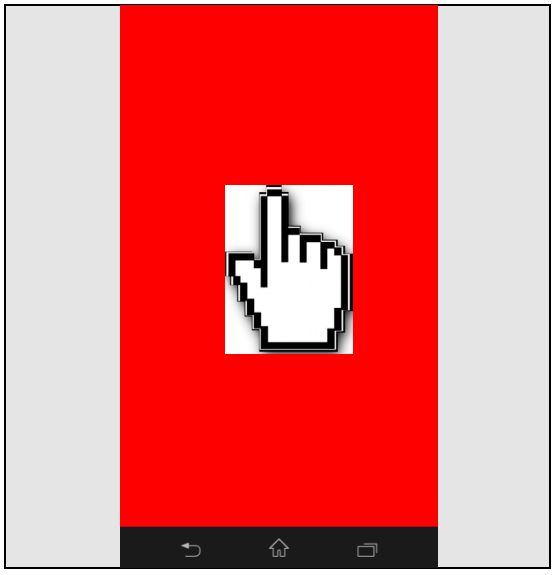


2.2.2 Display

Minor variations in the display's brightness and color may occur between phones.
There may be tiny bright dots on the display, called defective pixels and which occur when individual dots have malfunctioned and cannot be adjusted.
Two defective pixels are considered to be acceptable.

Touch the display using a finger. With every touch, the display will show Nine test patterns of White, Gray, Black, Red, Green, Blue, Rainbow Colors, Cross-Line, TV Pattern on the full screen. Make sure that there are no missing segments and that the colors and contrast are OK.

Press the Back key to return to the Service Test Menu.



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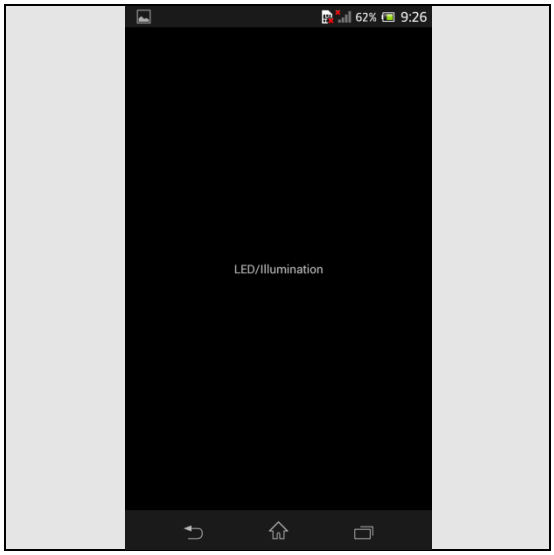
2.2.3 LED/Illumination

Check that the:
- Display Backlight illumination goes from low to high strength back to low again.
- Notification LED located inside earphone port on top of the phone changes, showing four colors in the following sequence: red, red, green, green, blue, blue and off.

Press the Back key to return to the Service Test Menu.



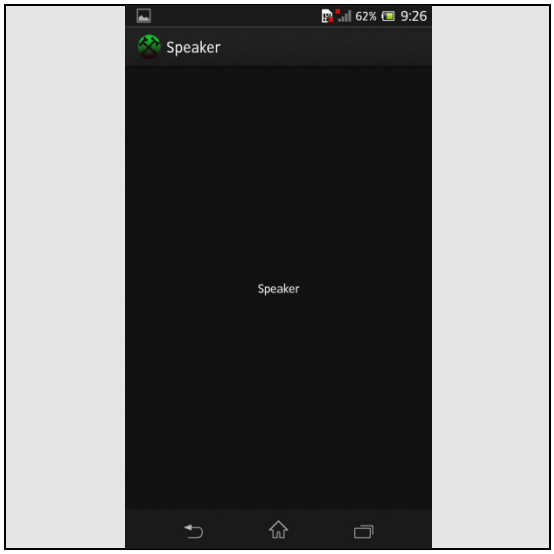
2.2.4 Speaker

Do not hold the phone close to an ear during this test!

Make sure that the sound from the speaker port on the top of the back side of the phone is emitted loud and clear and that the test includes maximum volume.

Press the volume up/volume down key to adjust the speaker volume.

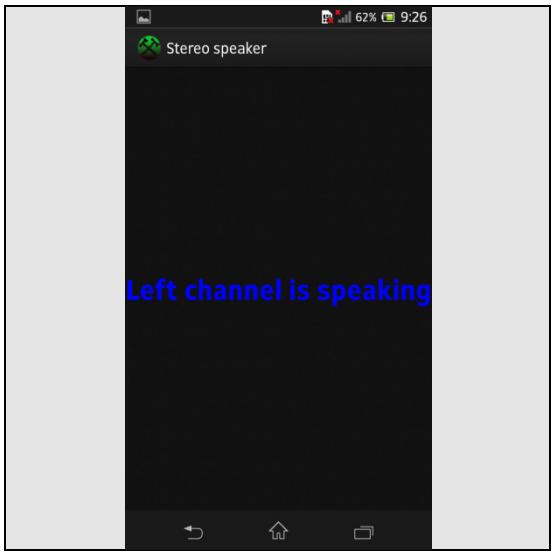
Press the Back key to return to the Service Test Menu.



2.2.5 Stereo speaker

N/A.

Press the Back key to return to the Service Test Menu.



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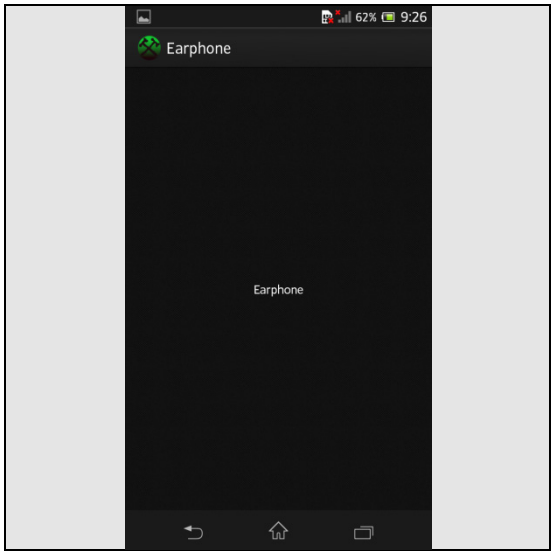
2.2.6 Earphone

Make sure that the sound from the earphone port on the top of the phone is emitted loud and clear and the test includes maximum volume.

Press the volume up/volume down key to adjust the earphone volume.

Press the Back key to return to the Service Test Menu.

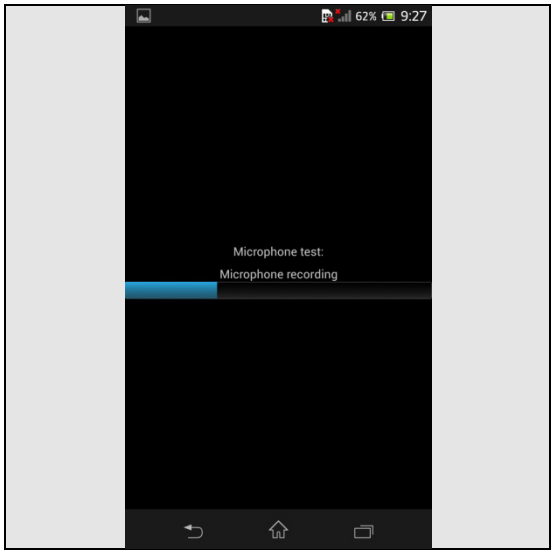


2.2.7 Microphone

The previous 'Speaker' test must have been successfully carried out before doing this test!

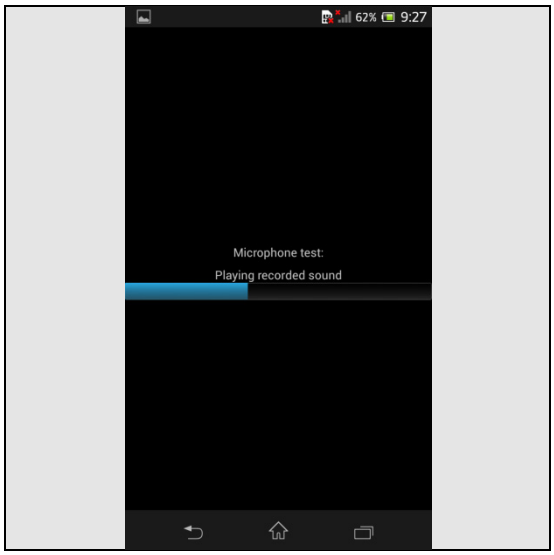
The phone will start to record and after approximately ten seconds the sound is played back through the speaker.

Step 1: Speak into the microphone during the 'Microphone Recording' phase;



Step 2: Check the quality by listening to the recording from the speaker during the 'Playing recorded sound' phase at maximum volume.

Press the Back key to return to the Service Test Menu.



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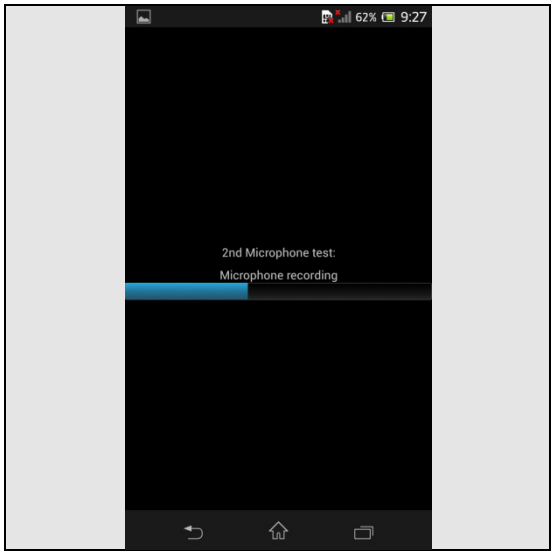
2.2.8 Secondary Microphone

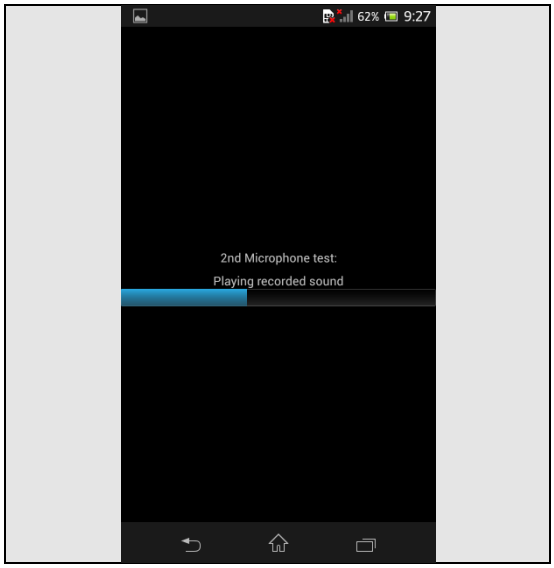
The previous 'Speaker' test must have been successfully carried out before doing this test!

The phone will start to record and after approximately ten seconds the sound is played back through the speaker.

Step 1: Speak into the secondary microphone during the 'Microphone Recording' phase;



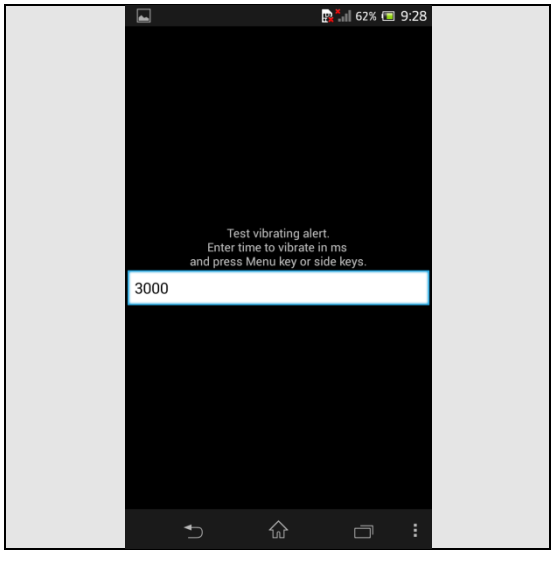
Step 2: Check the quality by listening to the recording from the speaker during the 'Playing recorded sound' phase at maximum volume.



Press the Back key to return to the Service Test Menu.

2.2.9 Vibrator

Press the Menu key or side keys to start the vibrator test. It is possible to modify the duration of this test.



Press the Back key to return to the Service Test Menu.

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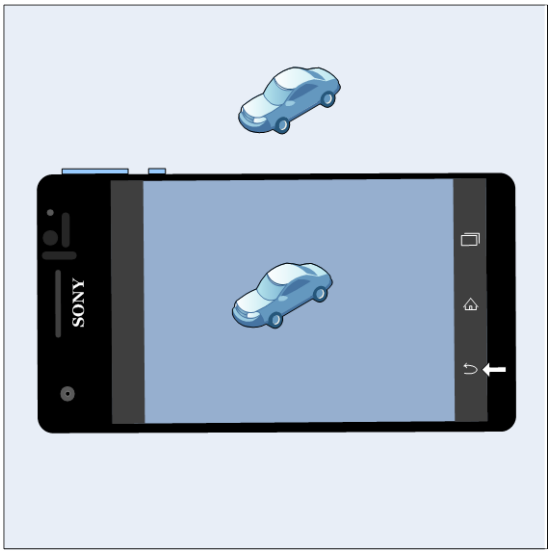
2.2.10 Camera

Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

Aim the camera (located at the back of the phone) at an object and check the quality of the image shown in the display.
Touch the screen to take picture and preview the photo's auto focus quality.

Photos are taken but not saved during this test!

Press the Back key to return to the Service Test Menu.



2.2.11 Secondary Camera

Minor variations in image appearance may occur between phones, but is not uncommon and should not be regarded as an indication of a defective camera module!

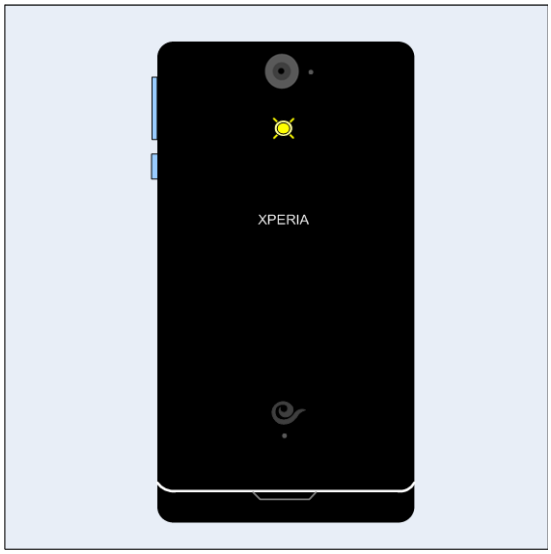
Aim the camera (located in front of the phone) at an object and check the quality of the image shown in the display.

Press the Back key to return to the Service Test Menu.

2.2.12 Flash LED

Check the Flash LED at the back side of phone whether it's turned on.

Press Back key to return to Service Test Menu.



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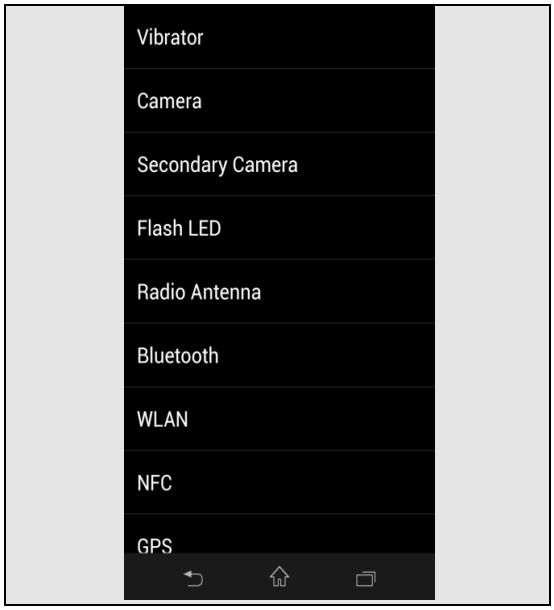
2.2.13 Radio Antenna

N/A.

Do not use this test!



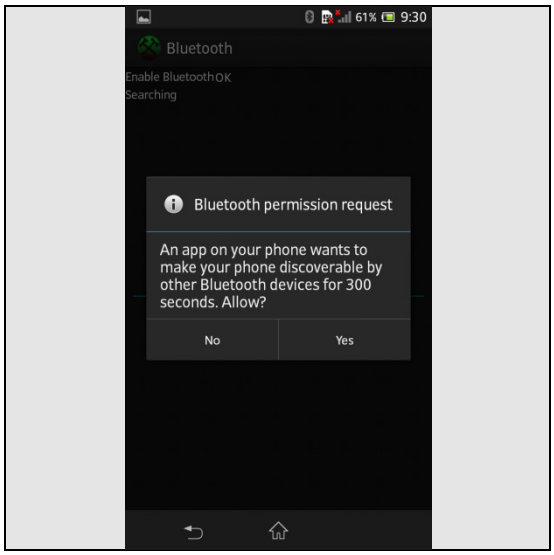
2.2.14 Bluetooth

During this test, the distance between the phone and the target Bluetooth device must be 1.5 to 5 meters!
Make sure the target Bluetooth device is enabled and visible always!

The Bluetooth test will be done in following sequences:
Step 1: Enable Bluetooth; wait 4-5 seconds, shows OK;

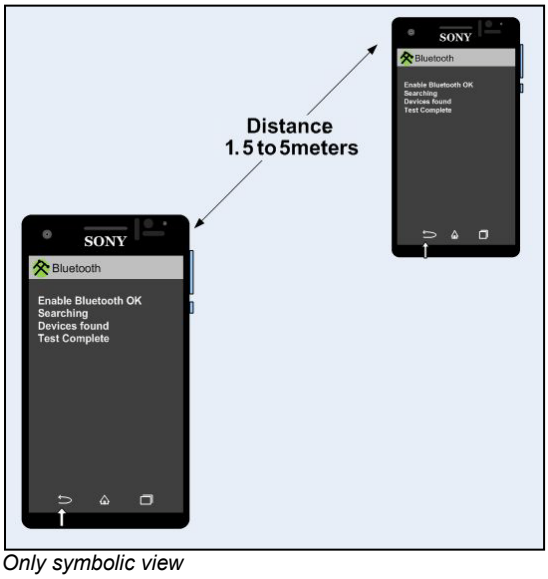
There is a permission request, select 'Yes'.

Step 2: Searching;
Step 3: Show the Device Found list;



Step 4: Select the Target Bluetooth Device, and type the PIN code to pair;
Step 5: Type the Pairing PIN code on the Target Bluetooth Device also, when successful, it shows 'Test Complete'.

Press the Back key to return to the Service Test Menu.



Only symbolic view

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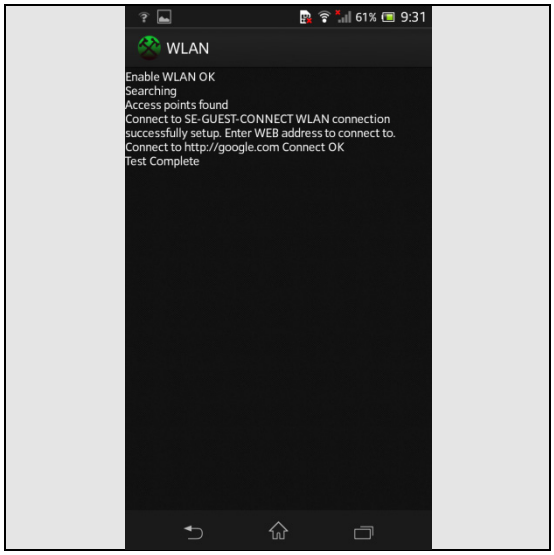
2.2.15 WLAN

Make sure there's a WLAN network before performing this test.

The WLAN test will be done in following sequences:
Step 1: Enable WLAN; wait 4-5 seconds, shows OK;
Step 2: Searching;
Step 3: Access points found list;
Step 4: Select the Target WLAN network, and type the password to get connected;
Step 5: Enter a web address (e.g. Google.com);
Step 6: When connection succeeded, it shows 'Test Complete'.
Press the Back key to return to the Service Test Menu.



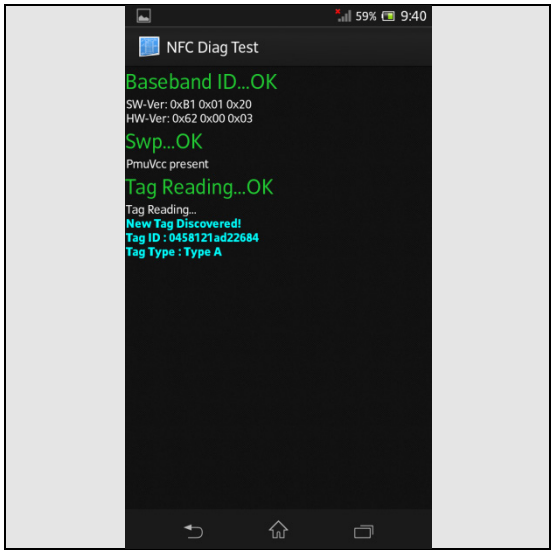
2.2.16 NFC

A NFC SIM card 3FF should be inserted in the phone before the start of this test!

The NFC test will be done in following sequences:
Step 1: Select 'NFC';
Step 2: Select 'NFC Diag Test';
Step 3: After 'Tag Reading…Enabled' can be seen on the display, bring a NFC Tag close to middle of Rear Cover Assy.

Don't touch each other to avoid Window Back scratch.

Press the Back key two times to return to Service Test Menu.

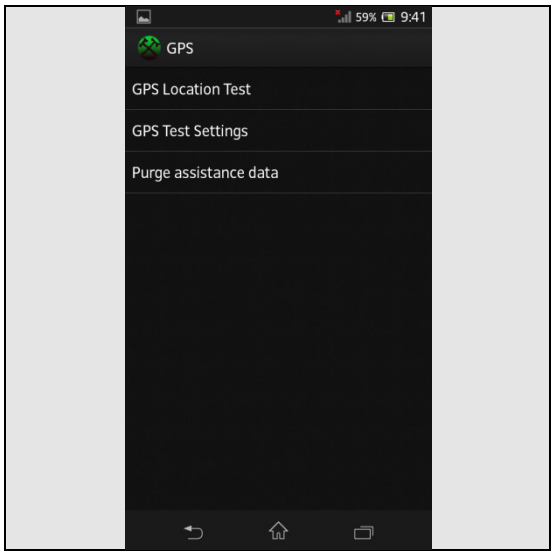


2.2.17 GPS

Enter the GPS Location Test and wait for the GPS location data.

Press the Back key to return to the Service Test Menu.

For GPS testing, refer to 1220-1333: Generic Repair Manual – mechanical



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2.2.18 Compass

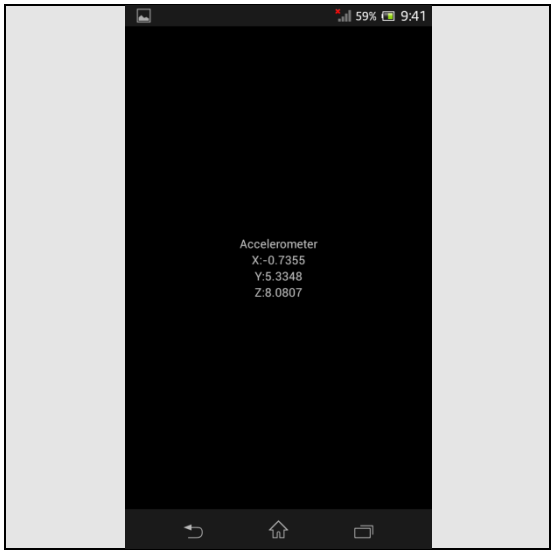
Do calibration with hand movements as shown in the phone, and then check the actual direction with measured value. (Yaw:0=North, 90=East, 180=South, 270=West)

Press the Back key to return to the Service Test Menu.

2.2.19 Accelerometer

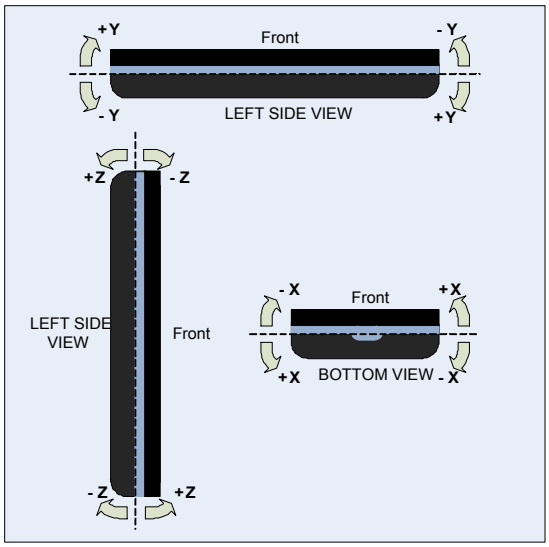
The accelerometer test displays the actual position of the phone as a 3D coordinate X: Y: Z.

Press the Back key to return to the Service Test Menu.



By tilting the phone in various directions, the X: Y: Z values will change in size and polarity depending on the angle and direction as shown in the adjacent picture.
Check by tilting the phone that the X: Y: Z values shown in the display are in accordance with the tilting shown in the picture.

Press the Back key to return to the Service Test Menu.



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2.2.20 Gyroscope

The gyroscope test displays the actual position of the phone as a 3D coordinate X: Y: Z.

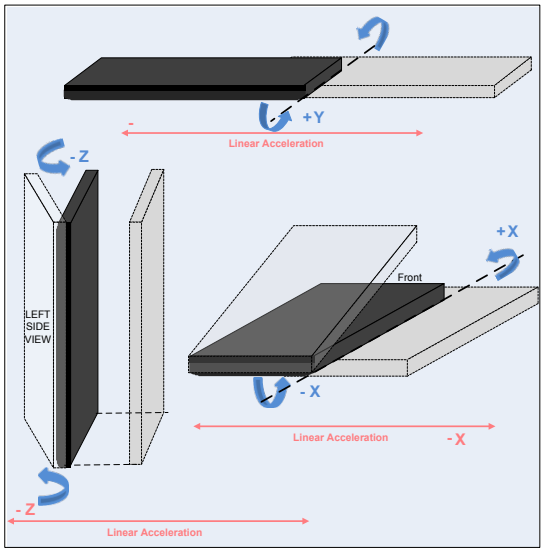
Check by moving the phone that the X: Y: Z values shown in the display are in accordance with the moving.

Press the Back key to return to the Service Test Menu.

Check ‘Gravity Values’ ‘Linear Acceleration Values’ ‘Rotation Vector Values’ and ‘Gyroscope Values’ by moving the phone:

‘Gravity Values’ can be refer to Accelerometer;
‘Linear Acceleration Values’ and ‘Rotation Vector Values’ are in accordance with the action shown in the picture.
‘Gyroscope Values’ are updated while moving the phone.

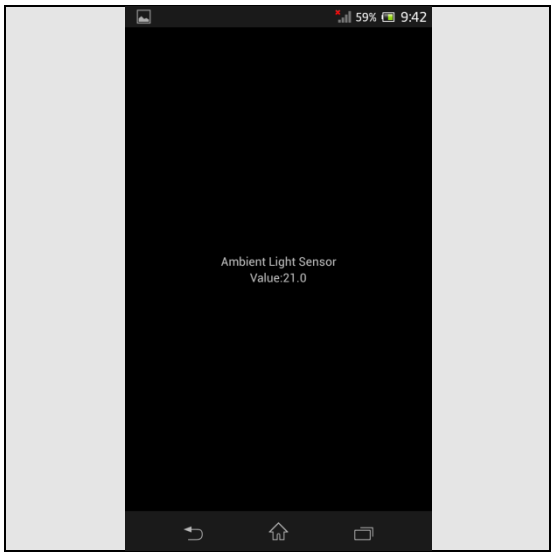
Press the Back key to return to the Service Test Menu.



2.2.21 Ambient Light Sensor

The Ambient light test states a value. The value should increase when the window gets more light and decrease when the window gets less light.

Press the Back key to return to the Service Test Menu.



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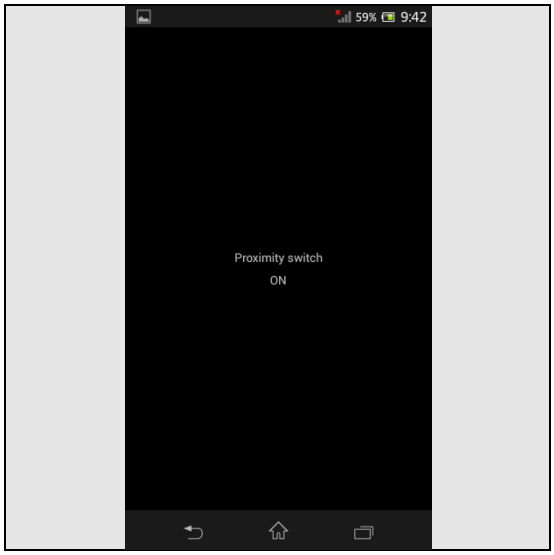
2.2.22 Proximity switch

The previous Chapter 2.2.4 'Speaker' test should have been successfully carried out before doing this test!
Make sure the phone is not in 'silent mode' before performing this test.

When entering into the test, the screen shows 'Proximity switch OFF' and a tone is emitted.

When covering the proximity switch area (on the left side of the Ear Speaker), the screen will show 'Proximity switch ON' with a different type of tone.

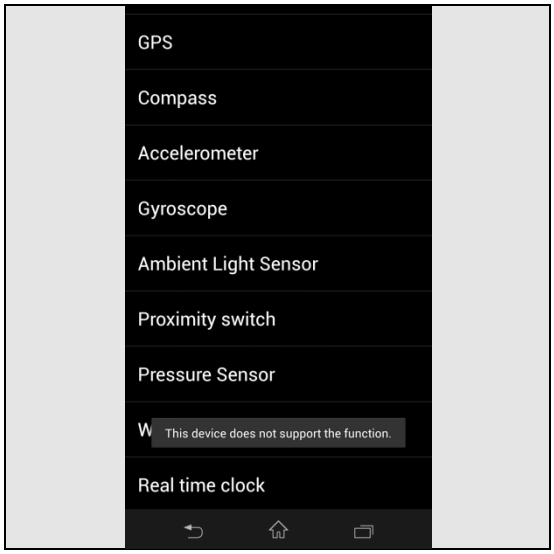
Press the Back key to return to the Service Test Menu.



2.2.23 Pressure Sensor

N/A.

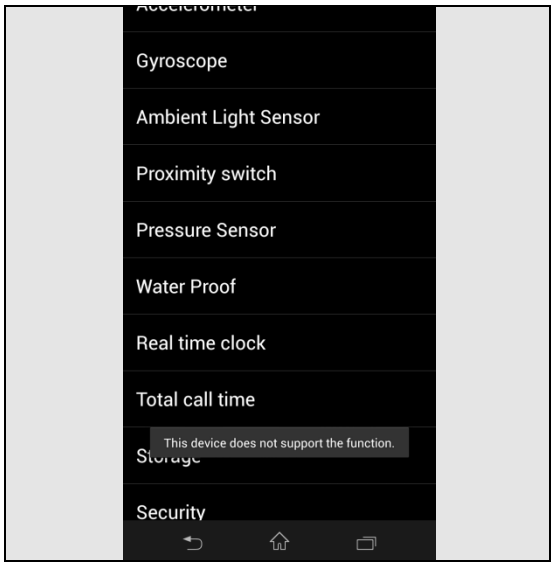
This test is not available for this product!



2.2.24 Water Proof

N/A.

This test is not available for this product!



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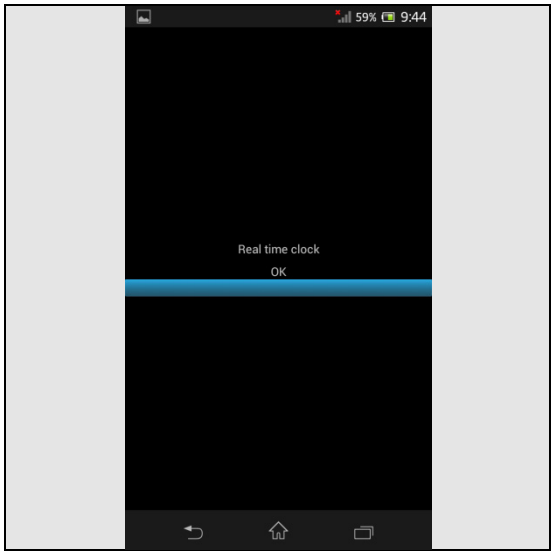
2.2.25 Real time clock

During the actual test the text ‘Real time clock’ is displayed, and then followed by a message stating whether the test was OK or not.

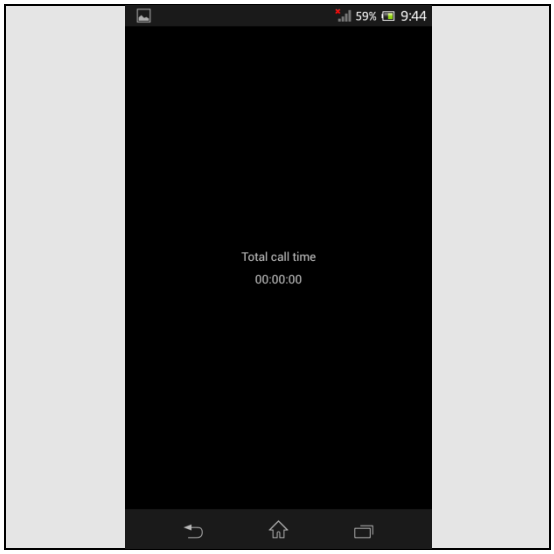
Press the Back key to return to the Service Test Menu.



2.2.26 Total call time

The total call time is displayed in the format HH:MM:SS (hours: minutes: seconds).

Press the Back key to return to the Service Test Menu.



2.2.27 Storage

Memory Storage status:

- Internal Mass Storage is ‘Inserted/Mounted’ as shown on the screen.

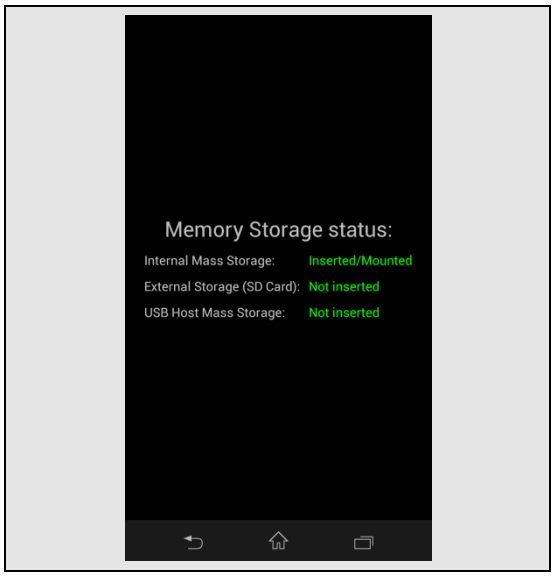
A memory card should be inserted in the phone before starting this test!

- The External Storage (SD Card) status is shown on the screen.

Attach USB Adaptor between phone and an USB disk before starting this test!

- The USB Host Mass Storage status is shown on the screen.

Press the Back key to return to the Service Test Menu.



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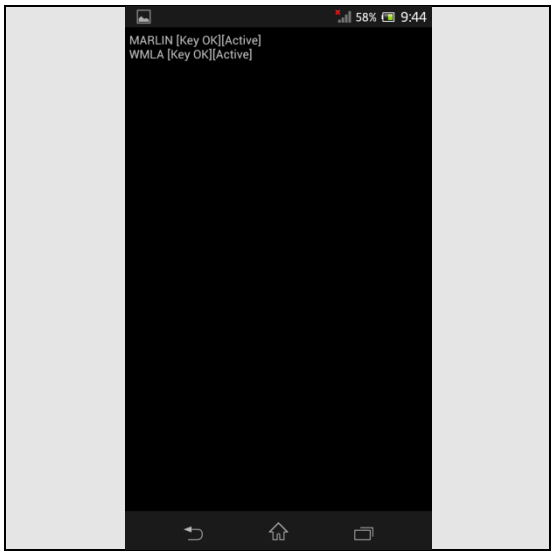
Tests: Service Tests

2.2.28 Security

The DRM keys are shown in the display.
There may be different content shown based on different market software versions.

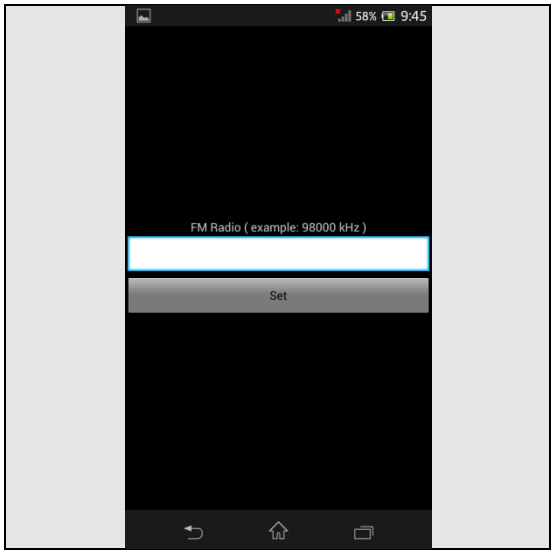
Press the Back key to return to the Service Test Menu.



2.2.29 FM Radio

Verify that the phone can detect a radio station:
Connect a headset and then set your local radio station in Hz.
Verify that the reception and sound quality is normal.

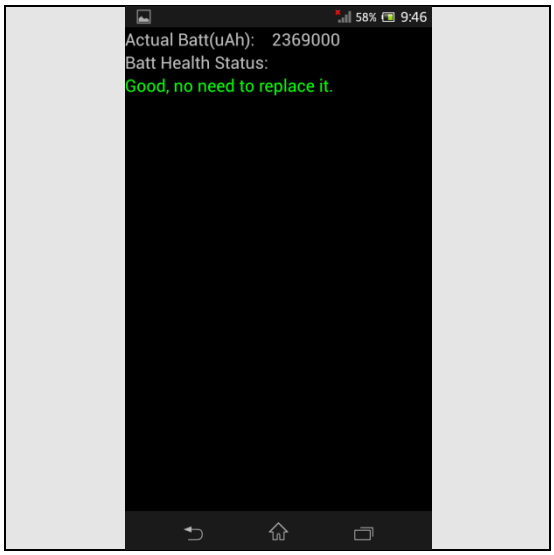
Press the Back key to return to the Service Test Menu.



2.2.30 Battery Health test

N/A.

This test is not available for this product!



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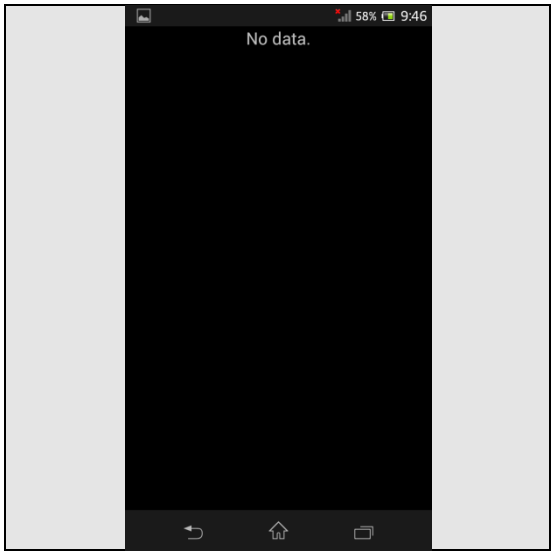
Tests: Service Tests

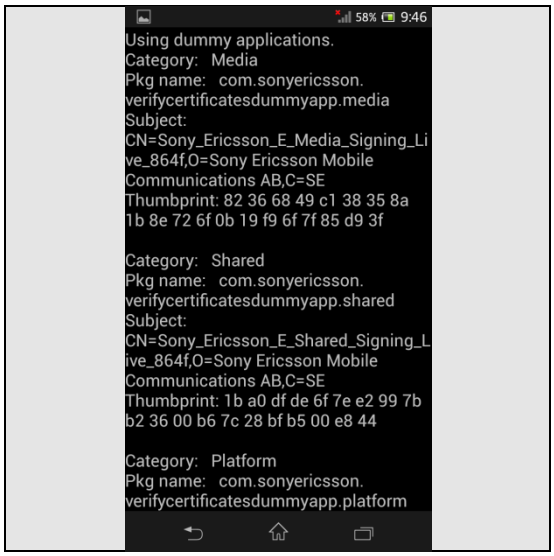


2.2.31 Flip slider counter

N/A.

This test is not available for this product!

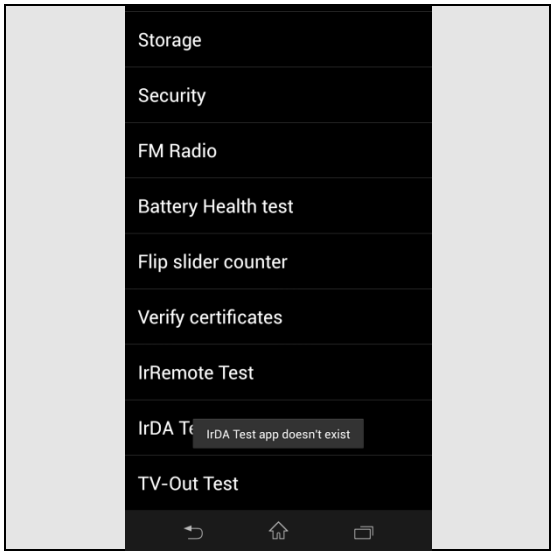
Press the Back key to return to the Service Test Menu..



2.2.32 Verify certificates

When entering the test, four information categories will be shown: Media, Shared, Platform and Application.

Press the Back key to return to the Service Test Menu.



2.2.33 IrRemote Test

N/A.

This test is not available for this product!

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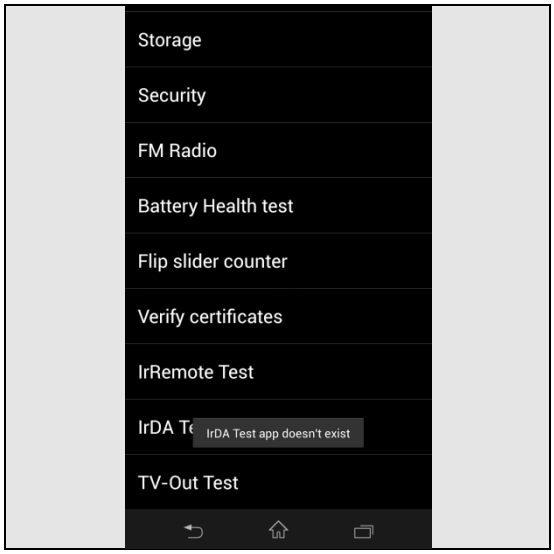
Tests: Service Tests



2.2.34 IrDA Test

N/A.

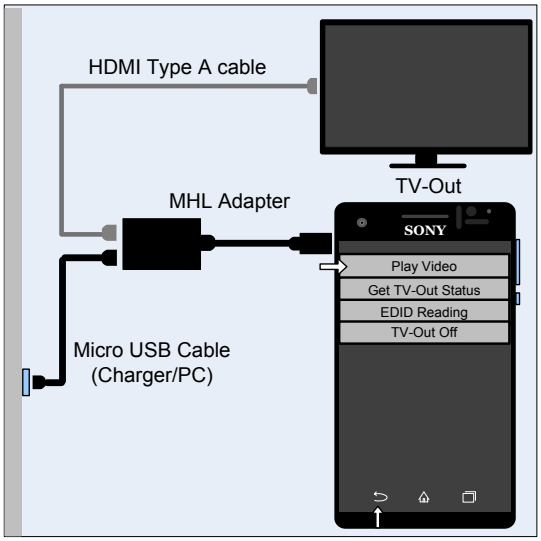
This test is not available for this product!

2.2.35 TV-Out Test

MHL adapter, HDMI Type A Cable, charger and TV should be connected with the phone before the start of this test!

Press 'TV-Out On'.

(TV-Out Settings is usually not needed since the unit should be in automatic resolution and the TV-Out monitor should set the resolution automatic. If you get no picture on the TV-Out monitor you can try different resolutions under TV-Out Settings.)



Step 1: Attach cable between phone and TV-Out as shown in picture;

Step 2: Press 'Play Video'.

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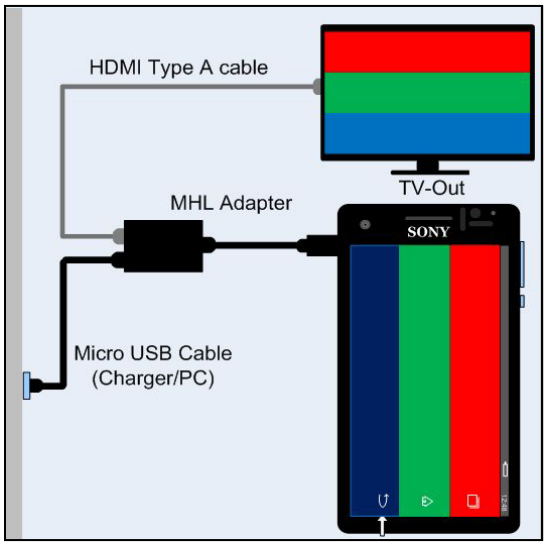
Tests: Service Tests

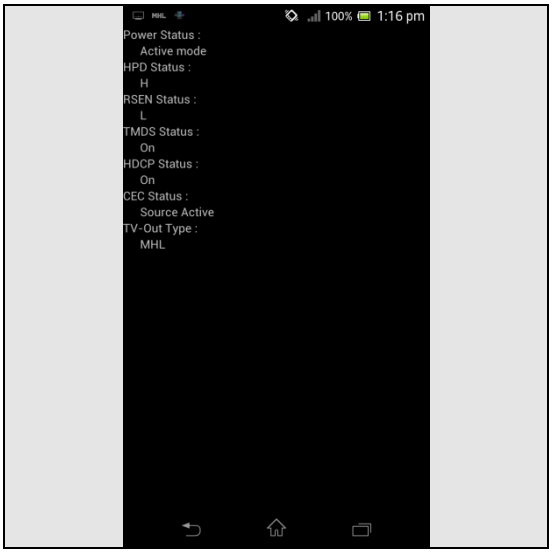
Receive a test tone and a red-green-blue test picture in the TV-Out Monitor and phone.

Note: If the TV-Out Monitor doesn't automatically indentify the picture, the Monitor may require to set the TV-Out port chosen as source manually in the Monitors menus.



Only symbolic view

Press 'Get TV-Out Status':
You should now get:
Power Status: Active
HPD Status: H
RSEN Status: H
TDMS Status: On
HDCP Status: On
CEC Status: Idle



Press the Back key to return to the Service Test Menu.

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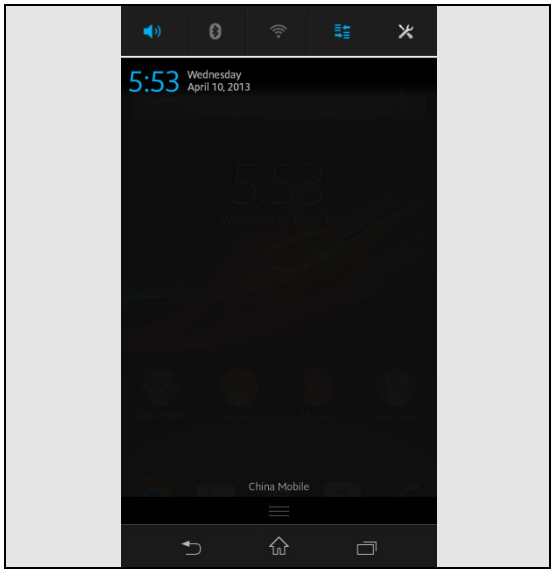
2.3 Manual Tests

2.3.1 SIM test



Verify that the phone can detect a SIM card:

Step 1: Insert a SIM card, and start the phone;

If the SIM card is detected by the phone, the start-up procedure will continue.

Step 2: Pull down the Status Bar (put finger next to the receiver and drag the menu down from the Status Bar);

Step 3: See SIM card operator name.

The SIM card operator name will be displayed above the Time Clock when phone is in Lock status.

If not detected, the message 'Emergency call only' will be displayed instead in the pull down Status Bar.

Press Back key to return to Standby Menu.

2.3.2 On/Off key test

Press the on/off key for a long time to turn the phone on or off.

Press the on/off key for a short time to enter Sleep mode or to wake it up from Sleep mode.

2.3.3 Home key test

Whatever the phone shows now during operation, press the Home key for the phone go directly back to the Standby screen.

Only symbolic view

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2.3.4 Multitask key test

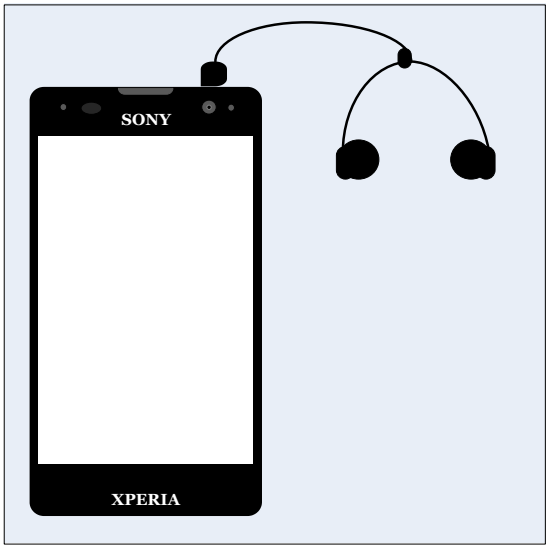
Whatever the phone shows now during operation, press the Multitask key to show the programs used recently.

Only symbolic view

2.3.5 Audio Jack test

Connect a Sony CTIA headset.
Repeat the test of “2.2.4 Speaker”, “2.2.6 Earphone” and “2.2.7 Microphone”.

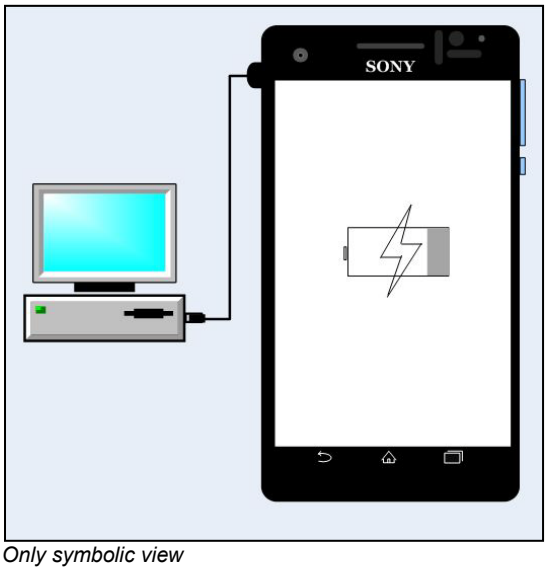
Make sure that the sound from Headset earphone ports are emitted loud and clear.



Only symbolic view

2.3.6 Data Communication test

- Connect a USB cable from a computer to the started phone.
- Verify that Data Communication works by transferring a file from Computer to phone
- Erase the file



Only symbolic view

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Tests: Manual Tests

2.3.7 Charging (Charger or Computer)

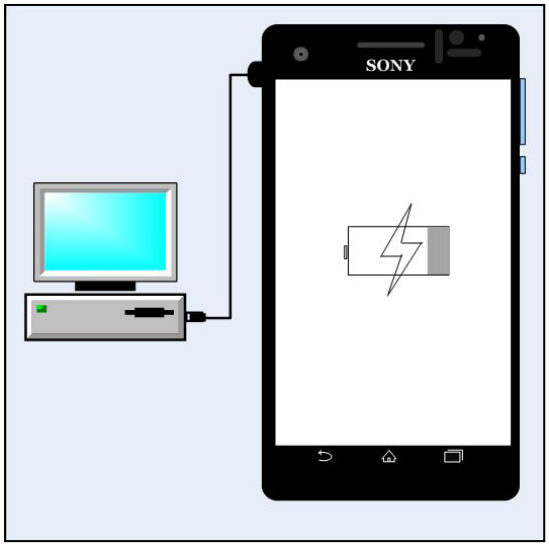
2.3.7.1 Charging via Magnetic connector (Charger or Computer)

Verify that the phone can charge the battery by using a Magnetic connector:

Connect a DK30 Magnetic Charging Dock from a computer or charger to the phone.

Verify that the phone is being charged by the notification LED and Battery icon in the display.

Remove the DK30 Magnetic Charging Dock from the connector and verify that the notification LED and Battery icon no longer indicates charging.



2.3.7.2 Charging via USB (Charger or Computer)

Verify that the phone can charge the battery by a USB port:

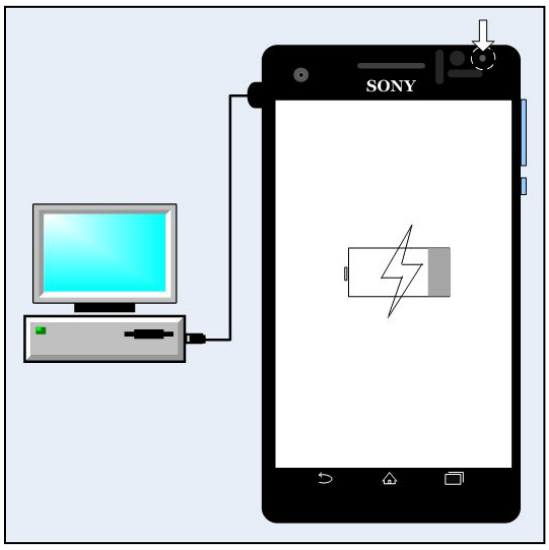
Ensure that no computer application, such as PC Suite or Emma, is active!

Do not start the phone.

Connect a USB cable from a computer or charger to the phone.

Verify that the phone is being charged by the notification LED and Battery icon in the display.

Remove the USB cable from the connector and verify that the notification LED and Battery icon no longer indicates charging.



Only symbolic view

The Notification LED colour status is depended on battery remaining capacity:

- Red: Battery level is between 1% and 10%;
- Orange: Battery level is between 11% and 89%;
- Green: Battery is between 90% and 100%;

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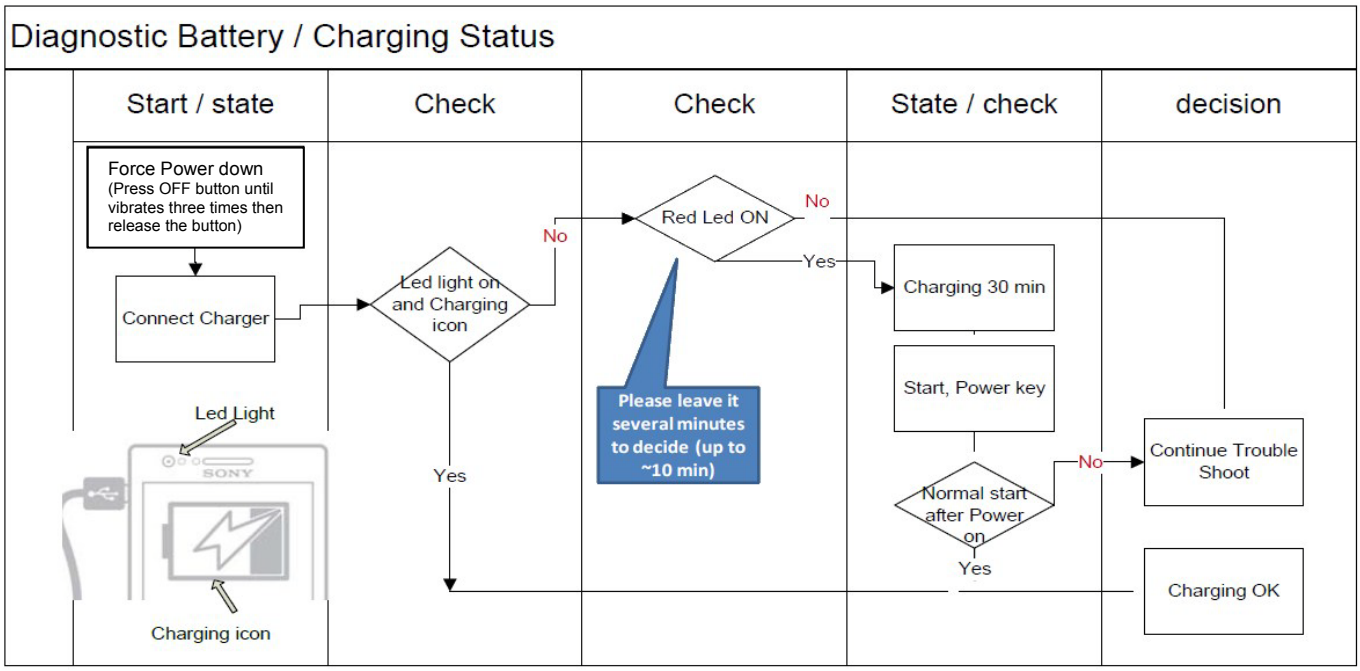
Tests: Manual Tests

If above fails, perform below Diagnostic battery / Charging Status check.

Perform a force shut down by pressing the OFF button as shown in picture, until the unit vibrates three times then release the button. Then the phone will shut down.

If no vibration is detected, the battery might be discharged.



The picture in above flow chart is only symbolic view.

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Tests

2.4 Battery Test

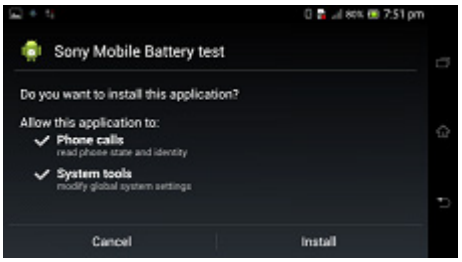
If bad battery performance or capacity problem is claimed, the battery and charging function can be tested by using an application designed for this purpose.
By using this application the battery is tested in a fast and controlled environment.
This is especially convenient when phones with embedded batteries should be checked, to avoid unnecessary work to disassembly the phone to access the battery.

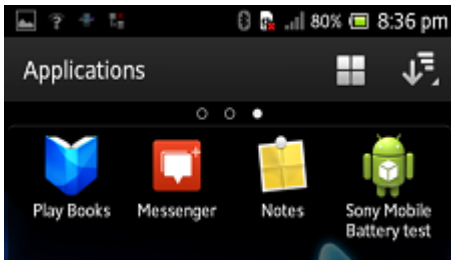
This test is designed to identify a faulty battery or a hardware issue in the phone or with the charger. The guide will describe different procedures depending on the battery level when the battery test is initiated.

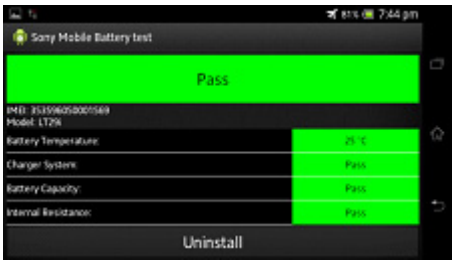
The test is downloaded to the phone, using cable or Bluetooth, and executed.
The test is available in CSPN at Level: Mechanical,
Title: **Sony Mobile Battery test Application 1266-2711**.
Unzip this file, where you find the application, installation and user guide content.

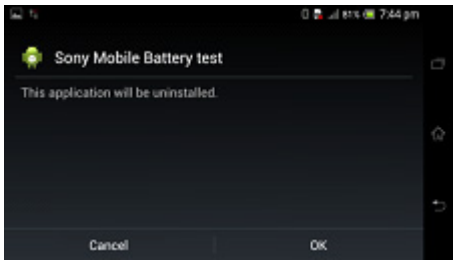
After the test the Sony Mobile Battery test.apk shall be removed by tap “Uninstall” “OK” in the application.

Error messages are described in the user guide for the Sony Mobile Battery test.









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2.5 Network Test

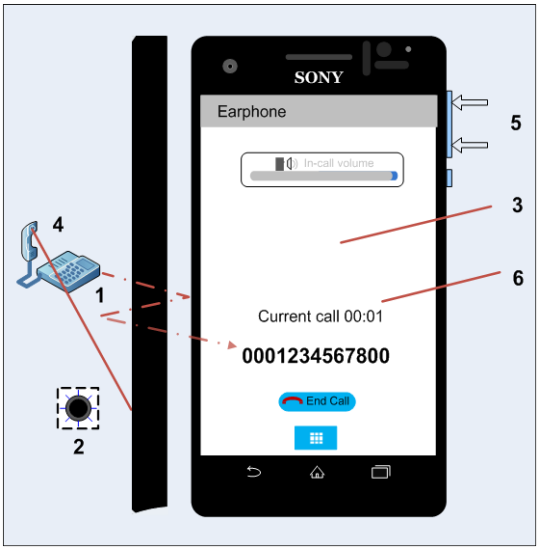
This test can only be performed if the phone has an activated SIM/USIM/UIM card (no Test SIM/USIM/UIM) and an available network signal!

There are different versions of the test depending on whether a LTE, UMTS or CDMA network is available or not!

If a LTE, UMTS or CDMA network is available, the network test has to be done separately for GSM, UMTS, CDMA or LTE!

2.5.1 Procedure (GSM & UMTS & CDMA)

Step 1: Set up a call from a landline phone (PSTN).
Step 2: Check that there is a ring signal.
Step 3: Check that the display backlight illuminates.
Step 4: Answer the call and check the sound quality in both phones.
Step 5: Adjust the volume up and down with the side keys and verify that the sound level is altered.
Step 6: End the call and check that the elapsed time is displayed and that the termination is done properly.



Only symbolic view

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2.5.2 On-the-air call to mobile

GSM

Go to the Setting app:
Settings ⇨ *More* ⇨ *Mobile* Networks ⇨ Network mode ⇨ GSM only

Ensure that the Network Status icon show signal strength and show no symbol or E at the top of the display.

To verify the radio functions (GSM) of the phone, follow the '2.5.1 Procedure (GSM & UMTS & CDMA)' above.

UMTS

Go to the Setting app:
Settings ⇨ *More* ⇨ *Mobile* Networks ⇨ Network mode ⇨ WCDMA only
Ensure that the Network Status icon show signal strength and show 3G or H+ (HSPA) at the top of the display.

To verify the radio functions (UMTS) of the phone, follow the '2.5.1 Procedure (GSM & UMTS & CDMA)' above.

LTE (if available)

Go to the Setting app:
Settings ⇨ *More* ⇨ *Mobile* Networks ⇨ Network mode ⇨ LTE (preferred)/WCDMA/GSM

Ensure that the Network Status icon show signal strength and show LTE at the top of the display.

To verify the radio functions (LTE) of the phone, download data package by for ex. accessing the web.

Network Type can be checked in ⇨ *settings*⇨ *about phone*⇨*status*⇨ *Mobile Network Type*

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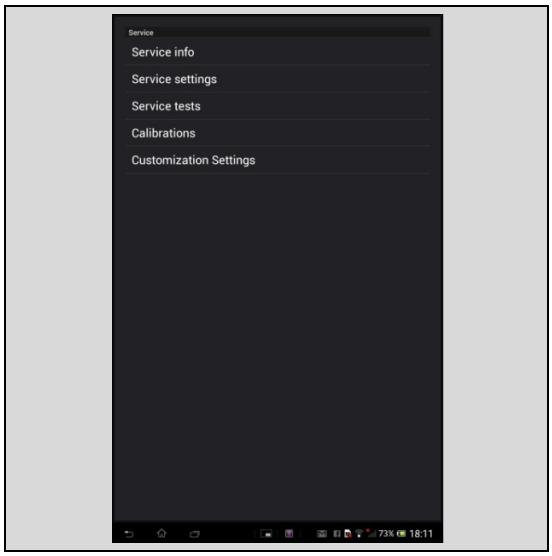
3 Calibrations



Calibrations have to be done if Exchange Board or PBA complete Sub (with Accelerometer and Gyroscope components) is replaced.

3.1 Gyroscope

Make sure you place the phone on a level surface by putting an air level on the window.

- In the Service menu, press Calibrations
- Press Gyroscope
- Press Calibration

Press Back key to return to Service Test Menu.

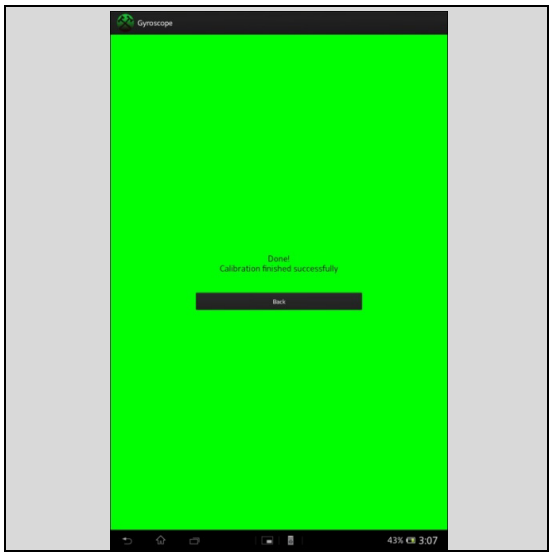
Only symbolic view

3.2 Accelerometer

Make sure you place it on a level surface by putting an air level on the window.

- In the Service menu, press Calibrations
- Press Accelerometer
- Press Calibration

Press Back key to return to Service Test Menu.



3.3 Proximity Sensor

N/A

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4 Revision History

Rev.	Date	Changes / Comments
1	2013-Sept-03	Initial release
2	2013-Sept-09	System problems
3	2013-Oct-10	Minor update to Calibrations

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